ITQ 300 Research Directors Recommended Reading:
Yoon (2007) Article and Carpenter (1989) Example
PJ Hallam, CPEC A&D, March 11, 2009

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report, REL 2007–No. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. http://ies.ed.gov/ncee/edlabs/regions/southwest/pdf/REL_2007033.pdf

* Even if professional development enhances teacher knowledge and skills and improves classroom instruction, a poorly designed evaluation or inadequate implementation would make it difficult to detect any effects from the professional development. (p. 4)
* Of the more than 1,300 studies identified as potentially addressing the effect of teacher professional development on student achievement in three key content areas, nine meet What Works Clearinghouse evidence standards, attesting to the paucity of rigorous studies that directly examine this link.
* This report finds that teachers who receive substantial professional development—an average of 49 hours in the nine studies—can boost their students' achievement by about 21 percentile points.
* All nine studies focused on elementary school teachers and their students. About half focused on lower elementary grades, kindergarten and first grade, and about half on upper elementary grades (fourth and fifth grades).
* Highlighting the problems of many studies of professional development, this report can help researchers avoid methodological pitfalls. Especially important is that researchers undertaking studies with quasi-experimental designs provide data on the baseline equivalence of the treatment and comparison groups.

Professional development affects student achievement through three steps. First, professional development enhances teacher knowledge and skills. Second, better knowledge and skills improve classroom teaching. Third, improved teaching raises student achievement. If one link is weak or missing, better student learning cannot be expected. If a teacher fails to apply new ideas from professional development to classroom instruction, for example, students will not benefit from the teacher's professional development. (p. 4)

The Nine Studies in *How Teacher Professional Development Affects Student Achievement*

Carpenter, T. P., Fennema, E., Peterson, P.L., Chiang, C. P., & Loef, M. (1989). Using knowledge of children's mathematics thinking in classroom teaching: An experimental study. *American Educational Research Journal, 26*(4), 499–531.
RCT; Kennedy Group 4, ITBS; effect size .41; not significant, but substantively important, improvement index 16.

Cohen, D. K., & Hill, H. C. (2000). Instructional policy and classroom performance: The mathematics reform in California. *Teachers College Record, 102*(2), 294–343.

Cole, D. C. (1992). The effects of a one-year staff development program on the achievement of test scores of fourth-grade students. *Dissertation Abstracts International*, *53*(06), 1792A. (UMI No. 9232258)

RCT; Kennedy Group 1; effect size .50, .82,.24; significant: yes, yes, no; adjusted cluster: yes, yes, no; Index improvement: 19, 29, 9.

Duffy, G. G., Roehler, L. R., Meloth, M. S., Vavrus, L. G., Book, C., Putnam, J., & Wesselman, R. (1986). The relationship between explicit verbal explanations during reading skill instruction and student awareness and achievement: A study of reading teacher effects. *Reading Research Quarterly, 21*(3), 237–252.
RCT; Kennedy Group 2; 0 effect size; not significant; Gates MacGinitie Readingexplicit teaching v. class management.

Marek, E. A., & Methven, S. B. (1991). Effects of the learning cycle upon student and classroom teacher performance. *Journal of Research on Science in Teaching, 28*(1), 41–53.
QED "with reservations"; Kennedy Group 3; Piaget tests; Effect .39; corrected for clustering; statistically significant; 15 improve index; 16 volunteer teachers, 11 nominated similar T for comparison; 10 randomly selected st/T.
A well-known study focused on elementary science teachers who participated in a 100-hour summer institute, during which they actively engaged in a standard "learning cycle" no follow up after intensive PD;

McCutchen, D., Abbott, R. D., Green, L. B., Beretvas, S. N., Cox, S., Potter, N. S., Quiroga, T., & Gray, A. L. (2002). Beginning literacy: Links among teacher knowledge, teacher practice, and student learning. *Journal of Learning Disabilities, 35*(1), 69–86.
QED; Kennedy Group 3; Gates-MacGinitie reading; Effect .39; no clustering correction, statistically significant; 15 improve index; more tests with clustering corrections, only kindergarten sample was useful.

McGill-Franzen, A., Allington, R. L., Yokoi, L., & Brooks, G. (1999). Putting books in the classroom seems necessary but not sufficient. *Journal of Reading Research, 93*(2), 67–74.
RCT; Kennedy Group 3; Hearing Sounds in Words; Effect size .97; adjusted for clustering; statistically significant; Index improvement 33.

Saxe, G. B., Gearhart, M., & Nasir, N. S. (2001). Enhancing students' understanding of mathematics: A study of three contrasting approaches to professional support. *Journal of Mathematics Teacher Education, 4*, 55–79.
QED; Kennedy Group 4; Fractions concepts, no cluster adaptation, 2.39 effect, 49 Index; Fraction computation, no, -.53 effect, -20 index.

Sloan, H. A. (1993). Direct instruction in fourth and fifth grade classrooms. *Dissertation Abstracts International, 54*(08), 2837A. (UMI No. 9334424)
RCT; Kennedy Group 1; CTBS; effect size .26, .63, .41, Correct for clustering: no, yes, yes; Index improvement 10, 23, 16; not significant, but substantively important.

Tienken, C. H. (2003). The effect of staff development in the use of scoring rubrics and reflective questioning strategies on fourth-grade students' narrative writing performance. *Dissertation Abstracts International, 64*(02), 388A. (UMI No. 3081032)
RCT with group equivalence problems; Kennedy Group 3; Narrative writing test; Effect size: .41; clustering accounted for: yes; significant: no, but substantively important; Index of improvement: 16.

Kennedy, M. (1998). *Form and substance of inservice teacher education* (Research Monograph No. 13). Madison, WI: National Institute for Science Education, University of Wisconsin–Madison.
Conclusion: Programs whose content focused mainly on teachers' behaviors demonstrated smaller influences on student learning than did programs whose content focused on teachers' knowledge of the subject, on the curriculum, or on how students learn the subject (p. 18).
Kennedy's classification scheme for professional development (PJH underlining):
Group 1 focused on teaching behaviors applying generically to all subjects. These behaviors might result from process-product research or might include strategies such as cooperative grouping. The methods are expected to be equally effective across school subjects.
Group 2 focused on teaching behaviors applying to a particular subject. Although presented for a particular subject, the behaviors have a generic quality and are expected to be generally applicable in that subject.
Group 3 focused on curriculum and pedagogy, justified by how students learn. Such professional development provides general guidance on curriculum and pedagogy for teaching a subject and justifies its recommendations using knowledge about how students learn the subject.
Group 4 focused on how students learn and how to assess student learning. Such professional development provides knowledge about how students learn particular subjects but does not provide specific guidance on practices